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AUTHOR Baldwin, Victor L.: Fredericks, H. D. Bud
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ABSTRACT

Inservice training procedures used to implement the Teaching Resource Classroom Model (a program for moderately, severely, and profoundly handicapped students) were evaluated with 94 teachers and administrators. The model is composed of the following 10 components: delivery of appropriate cues and consequences, assessment of student skill level, development of individualized programs, use of volunteers to conduct individualized instruction, use of aides to conduct group instruction, use of stimulation programs, use of toilet training programs, development of behavior intervention programs, use of systems to monitor maintenance of acquired skills, and the conduct of home programs. Data for the 5 day inservice session and subsequent followup services revealed that the educators achieved criterion level for 98% of the training objectives. Training and classroom costs were also computed. (CL)

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II. Project Directors: Victor L. Baldwin and H. D. Bud Fredericks

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V. Brief Description of Project:

One of the major functions of a national demonstration project is to be able to design educational intervention procedures that produce a significant impact on improvement in student performance and subsequently demonstrate that these techniques can be generalized to other educational settings with similar results. In order to accomplish the second half of this commitment it is necessary to develop a specific set of inservice training procedures that insure other professionals can learn how to implement the educational model. Data are submitted to demonstrate the effectiveness of the classroom model. However, this submission seeks to validate the inservice training procedures utilized to replicate the Teaching Research Classroom Model in other settings.

The Teaching Research Infant and Child Center classroom serves moderately, severely and profoundly handicapped students of various diagnoses, ages 8 to 18 years. Included are students classified as mentally retarded, cerebral palsied, autistic, emotionally disturbed, and deaf/blind. One of the purposes of the classroom is to demonstrate the feasibility of non-categorical education of handicapped students.

The classroom is formulated on the principle of individualization of programs within the context of a comprehensive curriculum emphasizing self-help, practical living, motor, language, and cognitive skill development. The classroom is certified by the Oregon Department of Education and is in part funded by local school districts. The model classroom is designed to serve 14 students with a teacher and two aides and utilizes volunteers and parents to assist in the instruction of the students.

THE DATA BASED CLASSROOM MODEL. The model, replicated in classrooms throughout the United States, has been described in A Data Based Classroom for Moderately and Severely Handicapped Children (Fredericks, et al., 1977). The model utilizes two curricula, the Teaching Research Curriculum for the Moderately and Severely Handicapped (Fredericks, et al., 1976) and The Teaching Research Curriculum for Adolescents and Adults (Fredericks, et al., to be published). Both are based upon the principles of developmentally sequenced materials and task analysis of the skills to be learned. Priorities for determining which skills will be taught to students are derived from a pretest that contains items selected from the curricula. The skills to be taught are prioritized by the parent and educational staff with emphasis on those skills which will assist the student to function more effectively in society. Since inadequate language and motor skills are the two

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most visible indicators of a handicapping condition, concentration is focused on these areas. After specific priorities are established, the student is placed in one or more curricular areas - self-help, motor, language, cognitive, and practical living skills.

Self-help skills include dressing, eating, toileting, and personal hygiene plus more advanced stages of self-care. The motor curriculum includes the entire range of basic motor movements from tone normalization and trunk righting, to walking, running, and jumping. Fine motor skills as well as recreational skills (e.g., swimming, throwing and catching a ball) are included. In addition, some standard physical education activities designed to improve strength and stamina comprise part of the motor program. The language curriculum includes both expressive and receptive language. For some students, total communication, integrating manual and oral approaches, is used for language instruction.

Practical living skills include budget and money management, time telling, food purchase and preparation, clothing selection and care, sedentary and physical recreational activities, socialization and sex education.

The teaching of students must include the management of their social behavior. Inappropriate behavior which interferes with the learning process must be eliminated before effective teaching can occur. Thus, if inappropriate behaviors are exhibited by a student, the initial teaching efforts must remediate these behaviors.

Because of the severe and profound handicapping conditions of many of these students, individualized instruction is emphasized. The model makes a distinction between individualized programming and individualized instruction. Basically, individualized programming refers to placing the student in a curriculum based on functional ability, while individualized instruction implies a one-to-one teaching relationship. When group instruction occurs, the interactions are designed for each student's individual instructional program. In this model, group instruction is provided by the teacher or aide.

Trained volunteers assume an important instructional role in this model. Nearly all of the one-to-one teaching is conducted by these volunteers. Before they are given any instructional responsibilities the volunteers are taught the proper way to deliver instruction for a particular educational task and taught to record the student's correct or incorrect responses. The maintenance of the quality of volunteers' instructional skills is monitored regularly by the teacher. A volunteer is either rotated among the students to teach a specific subject area or is assigned to one or two students and conducts programs across a variety of curricular areas for those students.

A necessary component in successfully using volunteers in the instructional process is the establishment of individual instructional programs for each student. A program prescribes the skill to be taught, the way in which the materials are to be presented and the feedback to be given to the student. Specific recording procedures to measure student performance on each program are prescribed and implemented. If the data show, or the volunteer indicates verbally that the student is having difficulty learning a particular program, the teacher attempts the prescribed instruction and determines if alterations are needed in sequencing, cue presentation, or feedback procedures. In all cases these educational decisions are made by the teacher based on student performance data that have been collected. These data provide the information needed by the teacher to determine the appropriate instructional level for each of the student's individual programs for the following day.

One of the assumptions of the model is that handicapped students learn in much the same way as non-handicapped students, only more slowly. Therefore, these students require more rather than less schooling when compared to normal students. The use of volunteers expands the amount of instructional time available in the classroom. Another attempt to expand the classroom day is to extend it into the home by teaching parents, foster parents and group home providers to serve as teachers. Utilizing the same training methods used to train volunteers, the teachers instruct the home providers in techniques to teach their children. Individual instructional programs, chosen by the parent and teacher to be taught in the home, are coordinated with programs in the school. Teaching periods in the home vary from 10 to 30 minutes daily. Performance data are collected in the home and sent back to the school the next day. These data allow the teacher to continue to make timely educational decisions.

The physical facilities for the classroom at Teaching Research include a large work area where children can have free time or where the teacher or aide can conduct group instruction. In addition to the large area, five individual instructional areas are provided. These are minimum requirements and local educational agencies that have adopted the model have had no trouble in locating similar facilities.

To date there have been more than 300 teachers trained in this model. The following is a brief description of the Inservice Training Model and data illustrating the degree of implementation and impact by those who have received training.

THE INSERVICE TRAINING MODEL. The Inservice Training Model includes both demonstration center and follow-up training. The first portion of the two part training involves participation in a five day training session at the demonstration center in Monmouth, Oregon. This training provides structured practicum experiences supplemented by small group seminars. During the five day session trainees complete nine objectives which are designed to develop competencies that will assist in their replication of the model. Criterion levels for evaluation of each objective have been specified (see Table 1).

Day one of the training week is devoted to orientation and observation of the demonstration classroom operated by the training staff. This observation period provides the trainee with an opportunity to see the model functioning in its entirety and provides a reference point as the model is dissected during the remainder of the week.

During days two through five the trainees participate in a four hour practicum in which they have the opportunity to perform each of three classroom roles: teacher, aide and volunteer. It should be emphasized that these practicum experiences are highly structured and follow a format of:

1. Demonstration of the task or role by a staff trainer.
2. Preparation for the task or role under the guidance of a staff trainer.
3. Performance of the task or role by the trainee.
4. Formal observation and feedback to the trainee on a frequent basis.

For ten minutes out of each 30 minutes during the four hour daily practicum period, each trainee is formally observed in their interactions with children. The trainee's performance is recorded on an observation form and at the conclusion of the observation his/her teaching performance is reviewed with him/her. In

addition, each trainee has a practicum in the administration of a placement test in the curriculum and a practicum in pinpointing and baselining an inappropriate behavior.

In the afternoon sessions trainees are taught how to examine and analyze the data collected on individual prescriptive programs and how to make educational decisions for each child's program for the following day. Small group seminars, each emphasizing a component of the model, are also presented each afternoon. Finally, the trainees prepare for the practicum experiences of the next day.

The second portion of the training program at the Teaching Research Infant and Child Center involves follow-up visits conducted at the trainee's own site. These visits are made by the same staff that conducted the training sessions at Teaching Research. Follow-up visits are scheduled eight to twelve weeks after the completion of the one week training session and again at 24 to 28 weeks after training. These follow-up visits are designed to measure maintenance of specific skills acquired during the training session, implementation of components of the Data Based Classroom Model that had been presented, and to provide assistance with any difficulties the trainees might have in the application of methods and materials learned during the five day training session.

For the purposes of measuring the degree of implementation of the Data Based Classroom Model, ten separate components have been defined. Each component has been carefully described on a rating sheet that includes how the observations are to be made, how the data are to be recorded and criterion levels. The ten components are:

1. Delivery of appropriate cues and consequences.
2. Assessment of student skill level.
3. Development of individualized program for each student.
4. Use of volunteers to conduct individualized instruction.
5. Use of aide to conduct group instruction.
6. Use of stimulation programs.
7. Use of toilet training program.
8. Development of behavior intervention program.
9. Use of system to monitor maintenance of acquired skills.
10. Conduct of home programs.

VI. Evidence of Effectiveness:

In order to demonstrate the effectiveness of this model, it was necessary to establish the following: (A) that the model could be taught to others; (B) that teachers who were trained could implement the major features of the model; and (C) that this implementation would result in improved student performance. Evidence of effectiveness is presented in each of these three areas.

A. Teaching the model to others. To demonstrate that the model can be taught to educators, the 94 individuals trained between the period of June 1, 1978 to May 30, 1979 were selected for study. During the five day training period, the number and percent of those achieving criterion in each of the nine training objectives are shown in Table 1. One thousand six hundred and fifty-one or 98 percent of the attempted 1,686 objectives were completed by trainees at specified criterion levels. Therefore, at the completion of the training week nearly every trainee was able to demonstrate that he/she could successfully perform the activities thought to be necessary to replicate this model.

Table 1. Number and percent of trainees achieving criterion in each of nine training objectives

Number	Objectives	Criterion	Number Trainees Participating*		Achieved Criteria N	Achieved Criteria %
1	Pre/posttest on Behavioral Terminology	92% Correct	93		90	97
2	Study Questions Pertaining to Reading Material	85% Correct	90		90	100
3	Delivery of Appropriate Cues, Consequences and Data as Volunteer	90% Correct	94	Cues: Consequences: Data:	91 91 92	97 97 98
4	Completion of Updating Exercise	83% Correct	89		87	98
5	Completion of Placement Identify Appropriate Program Clipboard Exercise	80% Correct 100% Correct 80% Correct	89 89 89		88 88 87	99 99 98
6	Design of Behavior Program	80% Correct	90		89	99
7	Delivery of Cues and Consequences as Aide Conducts Stimulation Program	85% Correct 80% Correct	90 88	Cues: Consequences:	87 87 88	97 97 100
8	Agreement Between Raters Using TR Observation Form	85% Correct	83	Cues: Consequences: Data:	81 80 79	98 96 95
9	On task in teacher role and completion of required activities as teacher	80% App. Time 60% On Task 80% Checklist	86 85 85	Approp. Time: On Task: Checklist:	86 84 86	100 99 100

* Aides are not required to complete all objectives.

B. Teachers ability to implement the model. During the same period of June 1, 1978 to May 30, 1979, of the 94 trainees who attended training 57 were teachers working directly with handicapped students. The remaining 37 trainees were either administrators or supervisory staff and therefore were not personally conducting a classroom No addition data after training were gathered on this group. Of the 57 teachers trained it was possible to obtain follow-up data on 40 of them. Seventeen could not be included because five had left their job, four were followed-up by another agency, and eight were trained too late in the year to receive scheduled visits at the time of this report.

The model is comprised of ten separate components (see p 4). At the time of the first follow-up visit (which occurs 8-12 weeks following training) the

first five components are examined for their presence and the quality of implementation. At the time of the second follow-up visit (approximately 24-28 weeks after training) the five components are reexamined and five additional model components are examined.

At the time of the first follow-up 83 percent of the first five components were present. Of those present, 72 percent were judged to have been implemented at established criterion levels. When the second follow-up visit occurred those five components were reexamined and 92 percent were now found to be present with 87 percent of those meeting criteria. Also on the second visit components 6-10 were examined and 51 percent were present and 74 percent of those were at criteria. Table 2 shows the data for the model components examined at the first and second follow-up visits.

Table 2. Percent of model components present and meeting criteria at follow-up visits one (8-12 weeks) and two (24-28 weeks)

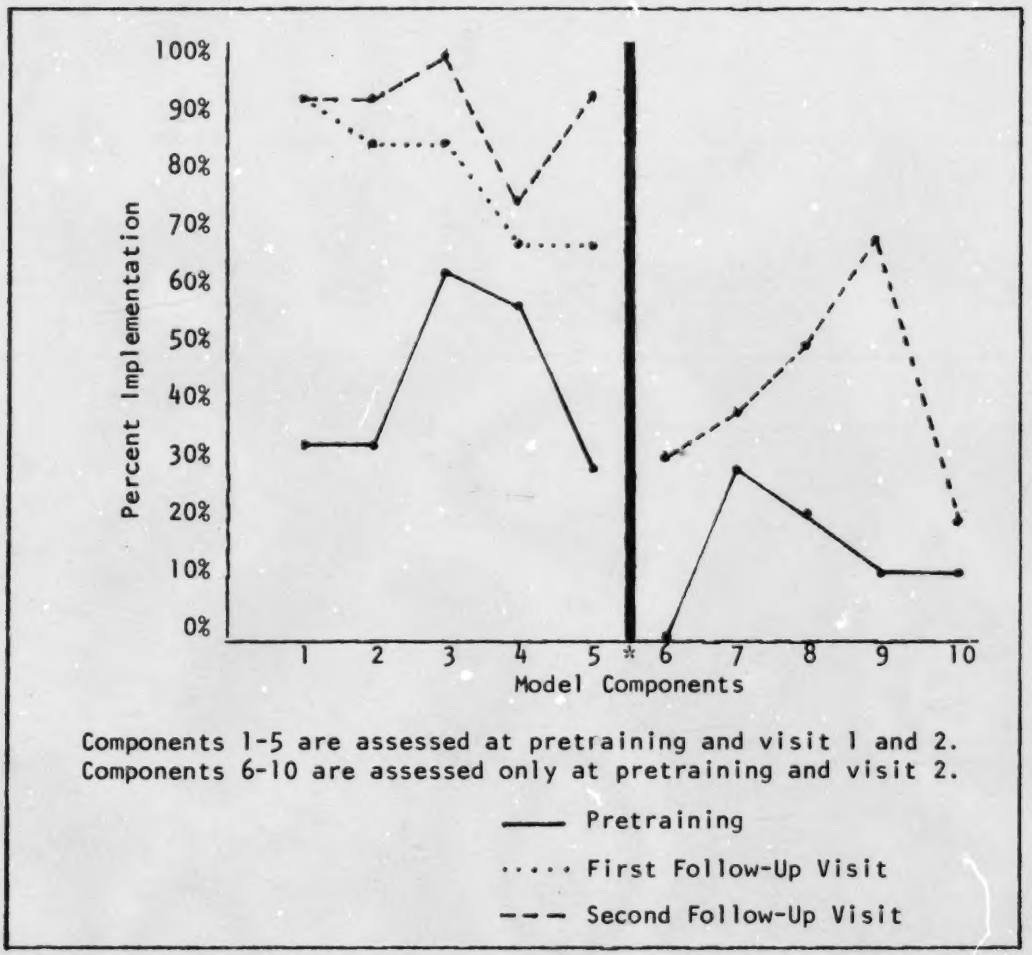
Visit	COMPONENTS			
	1-5		6-10	
	Present	Meeting Criteria	Present	Meeting Criteria
1	83%	72%	---	---
2	92%	87%	51%	74%

Twenty-five individuals, from the original sample of 94, who attended training June through August 1978 were sent to training by the Oregon State Mental Health Division. (The 25 were chosen as the sample because they would all be from Oregon and therefore cost effective to do a pretraining visit on half of them.) They were selected for training on the basis of the Mental Health Division's priority criteria of: (1) teachers, (2) rural model aides, (3) classroom aides. A random sample of 12 of the 25 were chosen to receive a pretraining visit. At the time of this visit baseline data were gathered using the same staff, instruments and techniques, used to measure posttraining performance. Data are displayed for 11 of the 12 trainees in Table 3. One of the trainees did not attend training due to illness.

The data in Table 3 show the relationship between the trainee's ability to implement the 10 major components (see page 4) before they came to Teaching Research for training, at the time of the first follow-up visit after training and at the second follow-up. In every case there was an increase in the number of components the trainees were able to implement after training and in all cases but one there was even further increases by the second follow-up visit. These data would seem to indicate that teachers definitely behaved differently after training and continued to do so for at least 24 to 28 weeks.

C. Improved student performance. No model can be considered effective unless after it is taught to others, it produces significant student progress. The progress of students described herein was measured not only in the Teaching Research classroom but in other Oregon classrooms for the moderately and severely handicapped. The instrument used for this measurement was the Student Progress Record (Mental Health Division, Salem, Oregon, 1972). This instrument measures student progress in 13 curricular areas: Social Skills, Receptive Language, Expressive Language, Reading, Writing, Numbers, Money, Time, Eating, Dressing, Personal

Table 3. Comparison of percent of 11 trainees implementing components at pretraining, first follow-up (8-12 weeks) and second follow-up(24-28 weeks)



Hygiene, Motor Skills, and Physical Fitness. Each student in classes for the moderately and severely handicapped in the entire state of Oregon is administered the Student Progress Record in the Fall, during a specified two week period, and again in the Spring during a specified two week period. Teachers administer the test to their students and the results are reported to the Oregon Mental Health Division.

To ensure reliability of reported scores, within two weeks after the teacher's testing, the Mental Health Division randomly selects a sample of students and curricular areas for retesting. Representatives from the Division require the retesting of the students in the sample while both the original teacher/tester and Mental Health Division observer score the child's performance. Inter-test and inter-rater reliability scores consistently exceed .90. During 1975-76 and 1976-77, a total of 2,702 students were administered the Student Progress Record on both pre- and posttests. Several types of evidence for the content and construct validity of the SPR have been collected over a six year period. The SPR has shown high content

validity as judged by curriculum experts' review of individual items--that is--the scope and sequence of each of the 13 domains of the test have been carefully based on task analyses and developed to match the curricula used in special education classrooms. The SPR exhibits a high degree of construct validity as evidenced by consistent student gains observed annually and differences between programs judged independently to vary in effectiveness. Empirical studies have also shown that the SPR possesses a high degree of factorial validity in that there are low interscale correlations combined with high internal consistency of each scale.

A random sample of 141 students, five percent of the total population tested through 1975-76 and 1976-77, was selected from classrooms where teachers had been trained in the Teaching Research model and who had demonstrated that they were implementing at least five of the model components at criterion level of performance. In addition, a random sample of teachers not trained was selected until an equal sized sample of 141 students was achieved. A comparison of the mean gain scores (Table 4) achieved by those students across the 13 curricular areas on the SPR indicated that those in classrooms whose teachers had been trained demonstrated gains significantly higher than the comparison group, t (280) = 3.43, $p < .001$.

Table 4. Number, mean and standard deviation of gain scores of students in TR teacher trained classrooms with a random sample of students in other classrooms

	N	$\bar{X}$	SD
TR Trained	141	7.20	5.33
Non-TR Trained	141	4.92	5.84

An examination of the ages of the two groups indicated no significant difference. An analysis of the pretest scores of the two groups indicated no significant differences between the two groups, t (280) = .36, $p > .50$ (see Table 5).

Table 5. Number, mean and standard deviation of pretest scores of students in TR trained classrooms with students in other classrooms

	N	$\bar{X}$	SD
TR Trained (before training)	141	41.41	20.73
Non-TR Trained	141	40.44	24.59

An attempt was made to examine the pupil progress performance (mean gain) of the students of both groups of teachers during the academic year 1974-75, one year prior to when the experimental group of teachers were trained at TR. Only four teachers of the TR trained group could be located for the previous year. These four teachers had an enrollment of 36 students for the same time period. Another 36 students were then randomly selected from the non-TR trained teachers. The pretest scores (Table 6) of these two groups were compared for 1974-75 and found to be not significantly different, t (70) = .47, $p > .50$ (Table 6). Gain

scores (Table 7) of the two groups were compared and also found to be non-significant for that year, t (70) = .50, $p > .50$. An examination of the age differences between the two groups showed no differences.

Table 6. Number, mean and standard deviation of pretest scores with teachers prior to any training, 1974-75

	N	$\bar{X}$	SD
TR Trained (before training)	36	46.72	20.16
Non-TR Trained	36	48.88	18.95

Table 7. Number, mean and standard deviation of gain scores of teachers prior to any training, 1974-75

	N	$\bar{X}$	SD
TR Trained (before training)	36	6.25	6.84
Non-TR Trained	36	7.10	7.36

Summary

The evidence for the effectiveness of the Teaching Research Classroom Model and inservice training procedures can be summarized, therefore, as follows: Data are provided which demonstrate that 94 educators trained in one academic year achieved criterion levels for 98 percent of the training objectives. When observed in their own teaching sites the trainees demonstrated the ability to implement the model as evidenced by 83 percent of the first five model components being present at the first follow-up visit. By the time of the second visit they were able to implement 92 percent of the components. Further there was a continual increase in the quality of the implementations as seen by the increase in the percent of the components meeting criteria by the second visit.

Additional evidence concerning the impact of training is shown by comparing teacher performance before training with the results after training and maintenance up to 28 weeks. There is a definite indication that teacher behavior in relation to the ten model components improves as a result of training and follow-up visits.

Finally, an examination of the gain scores achieved by students in classrooms where the teacher was trained in the Teaching Research Model indicated significantly greater skill gains (.001) than did a similar sample of children in classrooms not utilizing the model. Similar differences were not evident in the year prior to training with a sample of the same teachers. These gains would seem not only to be statistically significant but also educationally significant. The gains in student performance are reflective of a particular educational approach (Teaching Research) compared to a variety of other approaches as represented in the random sample. The growth across groups represents the acquisition of observable, measurable new behaviors that are each, one step closer to allowing the student to function independently.

Costs

The average annual operating costs per academic year per pupil, including administrative and overhead costs, range from $3,200 to $4,400 in classrooms using the model. Cost figures appearing in Tables 8 and 9 are actual costs for one year of operation of the classroom and training both of which occur at Teaching Research. In Table 8, it can be seen that the differences between initiation and continuation costs for the classroom are a result of increased need for administrative (technical) assistance and purchase of materials.

Training costs have been calculated to include cost for trainee travel and per diem to the Teaching Research site and for Teaching Research staff to conduct follow-up (see Table 9). The teacher and aides are shown at a 6-month rate because they are only directly involved in the training every other month.

Table 8. Classroom costs per year (12 months) per student (14)

		Initiation	Continuation
Administration	.50 FTE @ 24,080	860	.25 FTE 430
Teacher	1.0 FTE @ 18,956	1,354	1,354
Aide	1.0 FTE @ 12,188	942	942
Aide	1.0 FTE @ 9,002	643	643
Fringe @ 21.3%		809	717
Supplies		214	71
TOTAL		4,822	4,157

Table 9. Training cost per year (12 months) per trainee (28)

Administration	.20 FTE @ 24,080	172
Trainer	.25 FTE @ 14,784	132
Trainer	.25 FTE @ 13,552	121
Teacher	.25 FTE @ 18,956 (6 mo)	85
Aide	.25 FTE @ 13,188 (6 mo)	59
Aide	.25 FTE @ 9,002 (6 mo)	40
Secretary	.10 FTE @ 7,000	25
Fringe Benefits @ 21.3%		135
Supplies and Materials		170
Travel		300
Per Diem $35/day x 5 days (trainees)		175
Per Diem $35/day x 2 days (T.R. staff)		70
TOTAL		1,484

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